PLASTICS

A Periodical Devoted to the Manufacture and Use of Composition Products

MARCH, 1926

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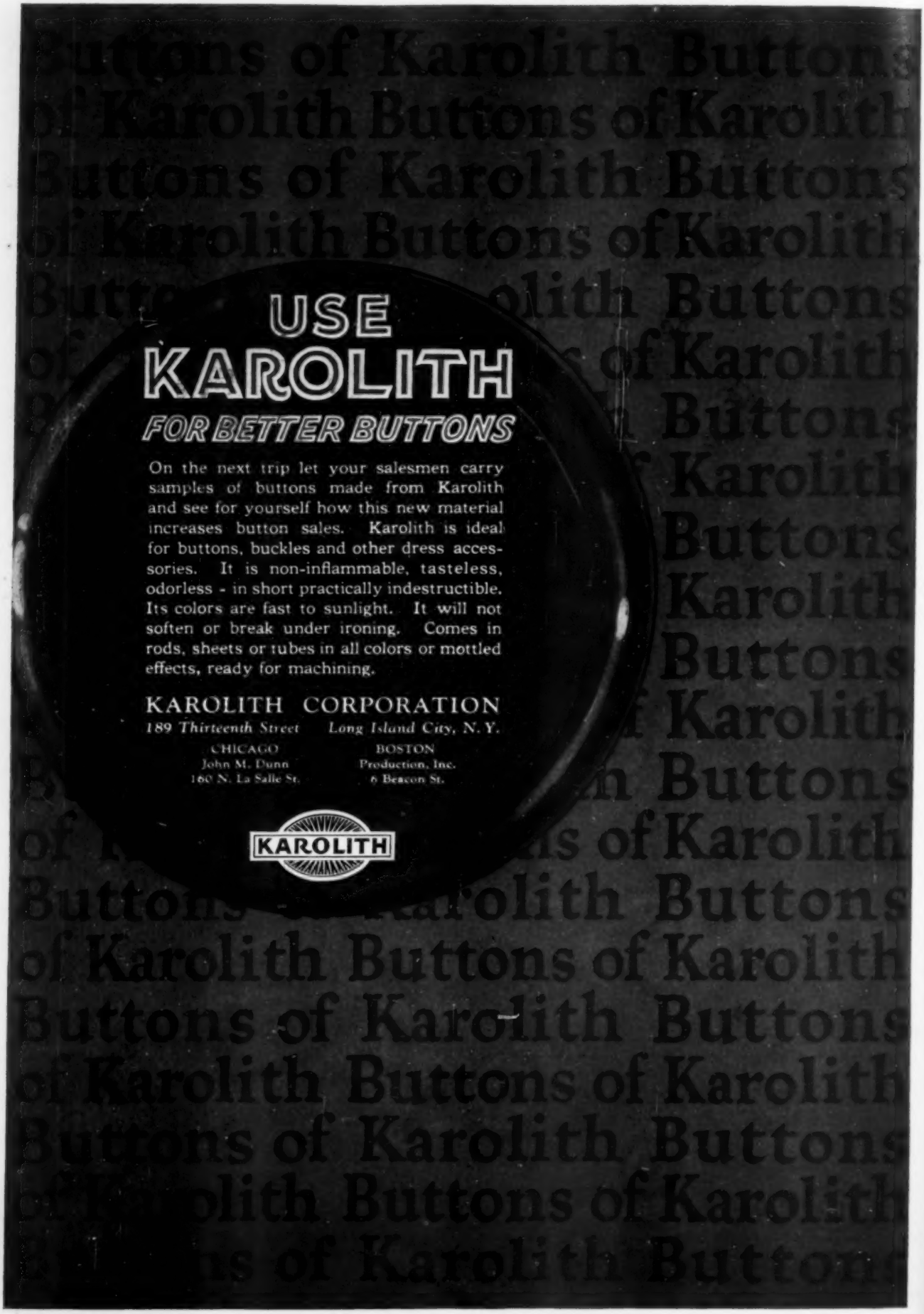
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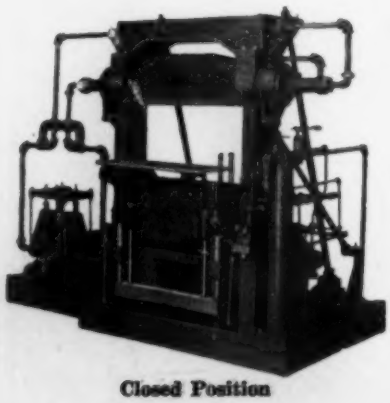
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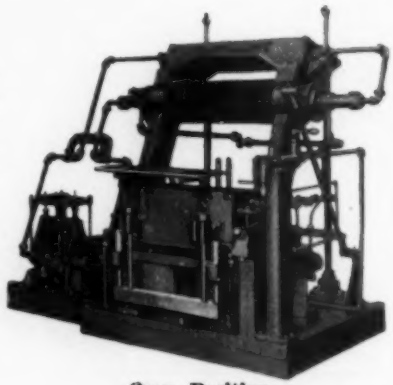
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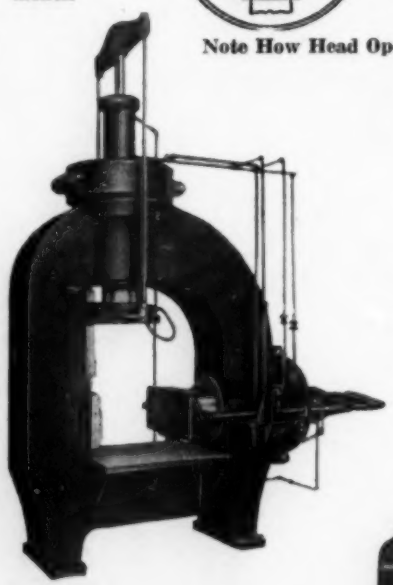


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WHEN the idea of a publication to serve the plastic industry was first broached, many men, well informed about conditions in the trade stated that we had an almost hopeless task in getting interesting material. They said it would be hard to find new subjects to talk about, and above all, practically impossible to have the men who know write about things they are best familiar with.

It is decidedly pleasant to say that instead of there being a dearth of information, *Plastics* has published, and is now holding for publication, some of the most enlightening and instructive articles that has ever been set in type.

It is also with much gratification that we can say that we have never had recourse to what is known amongst publishers as "boiler plate articles," never had to use general industrial subjects, or printed meaningless puffs of no specific value.

Not only has our staff worked tirelessly towards this publishing ideal, but many prominent men within the trade have given of their time and brains in contributing helpful, meaty, and instructive articles as well.

And we now take time out to cordially thank them and hope for more of the same.

It is warming to know that these sentiments are echoed by our readers. Almost every day *Plastics* receives complimentary letters and the demands for back numbers, unquestioned evidence of merit, has been unprecedented in our many years of publishing.

Plastics has a goodly supply of worthwhile material awaiting publication to fill many forthcoming issues, but a trade paper is rapacious; so send on more for its mastication and for the general benefit of every one in this lusty industry.

The Publishers.

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Vol. 2 March, 1926 No. 3

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PLASTICS

A periodical devoted to the manufacture and use of plastic and composition products

Vol. 2 MARCH, 1926 No. 3

Development of Molded Sound Records

The efforts of Eldridge K. Johnson gave rise to the impressive modern phonograph industry

By Carl Marx

The evolution of the phonograph record was described in the February issue of this magazine, page 47. Its modern development is carried forward in the present article.

ALTHOUGH records could now be made, it still required tremendous efforts to find a means of faithfully reproducing the sounds which were locked up in the same and to render them audible and useful. The earlier machines were all hand-driven and it was not until Eldridge K. Johnson, the founder and present head of the Victor Talking Machine Co. perfected a steady-running and practically noiseless motor that the phonograph as we know it today became such a universal necessity in every home. This claim to priority in putting a practical machine upon the market is challenged by the Columbia Graphophone Co. in behalf of Edward D. Easton, one of the founders of the company, and for whom it is claimed that "he was the first man in the world to offer a talking machine for use, sale or rental." The development of the disc record on the part of this company was the work of Thomas Hood Macdonald and J. W. Jones, all of which contributed much to the modern art of record-production. The Columbia Company chose to call their apparatus a Graphophone and in 1898 the U. S. Patent office officially adopted the word "Graphophone" then the designation of sound reproducing machines.



Eldridge K. Johnson

Be that as it may, it is quite certain that the invention of the disc record was the turning point in the industry, and at the present time even the Edison machines use this type, the wax cylinder record being only retained for the ephemeral spoken records which replace the stenographer.

Victor Talking Machine Co.

ANYONE who has ever had the good fortune of visiting the impressive plant of the Victor Talking Machine Co. at Camden, N. J., must have been struck by the hugeness of this unique establishment. Located on the Delaware River, directly across from the foot of Market Street, Philadelphia, the plant presents an interesting sight even when approaching the same via boat. It is housed in twenty-five buildings of the most modern type of construction, covering an area equivalent to no less than ten city blocks. The floor area of the buildings, all of which are fireproof, is approximately fifty acres. Many of the buildings are from six to eight stories in height and are noteworthy for the large amount of window space, providing excellent lighting conditions.

It is stated that the amount of raw material kept in stock represents a value of about ten million dollars, of which about one-half is in hard-wood lumber—as the Victor Talking Machine Co. makes all of its own cabinets as well as the mechanical parts of their machines; and molds all of its records for the Eastern part of the United States and Europe at Camden. There is another record molding plant on

the Pacific coast for the western and Far East trade.

The electric power equipment provided fifteen thousand horsepower, consuming sixty thousand tons of coal per year. By far the greater part of this plant has been erected since 1909.

This remarkable achievement of building up so rapidly a new business as the phonograph, which prior to 1890 was practically a scientific toy, is mainly the work of Eldridge R. Johnson who has the happy faculty of surrounding himself with men of vision and ability and in developing among his thousands of employees an esprit-de-corps and a burning desire to keep their plant among the foremost of its kind by daily doing their work "just a little bit better than the other fellow," to quote one of the officers of the Company.



Record Inspection at the Victor Plant.

The present Victor Talking Machine Co. is outgrowth of an original firm of Scull & Johnson, founded in 1894 by the purchase by Mr. Johnson, of the older firm of Captain Andrew Scull and his son John Scull, a mechanical engineer of Lehigh University. Mr. Johnson had been foreman and manager for Capt. Scull since 1888. Johnson first developed a book-binding machine originated by the younger Scull, and which eventuated as the present product of the N. J. Wire Stitching Machine Co.

It will be seen that Johnson thus had the background of very thorough mechanical training, which enabled him to develop the phonograph motor later on. Among the work brought to his shop for repairs was one of the early models of a talking machine. Mr. Johnson saw the possibilities and as he puts it "the talking machine fever broke out all over me." Mr. Berliner had given the world the greatest basic improvement since Mr. Edison's original discovery, and I happened to be the man who happened to be there at the right time to give it the needed improvements and refinements.

Their greatest difficulty, to quote Mr. Johnson again was the "search of a process of recording that would give the true tone. It cost me $50,000.00 and two-and-a-half years of desperately hard work, but the Victor Company's factory is a standing testimonial that justifies the cost."

One of the most bitterly contested patent suits in the history of litigation ensued over the Berliner basic patents, as a result of which the present company evolved. The suit cost the Victor company over a million dollars, but it has proven a good investment at that.

The company was formed in 1901, so has been in existence just a quarter of a century. Reams could be written about the highly interesting things that are daily done in this huge manufacturing establishment, but the point of greatest import to users of plastic products is the truly remarkable achievement in mass production of molded records.

The Victor Record.

MUCH has been written about the manner in which modern phonograph records are made, but the points emphasized have usually dealt with either the recording methods, the means for electrically plating the master and duplicate metallic records and the making of the copper or steel-plated shells or molds from which the records are pressed. Suffice it to say that the original record from the voice or instruments is made in a wax composition which is dusted with graphite and plated with copper, making what is known as the master negative, which is a copper shell about 0.9 millimeter thick. Two or three test records are pressed from this. If it is satisfactory, duplicates of the master negative are made by taking impressions from the same in a wax composition, which is then treated just like the original wax impression. These wax impressions, known as "dubs" serve for preparing the molds, which are about half as thick as the master negative, and are usually backed with brass or are steel plated, the latter being the present-day practice.

The composition which receives the final sound-impression, is based on pure shellac, as nothing has been found to take its place although thousands of dollars and years of time have been devoted to research work

(*Continued on page 93*)

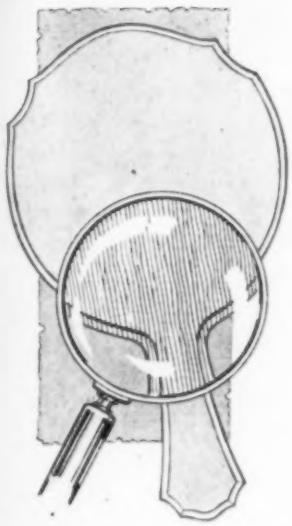
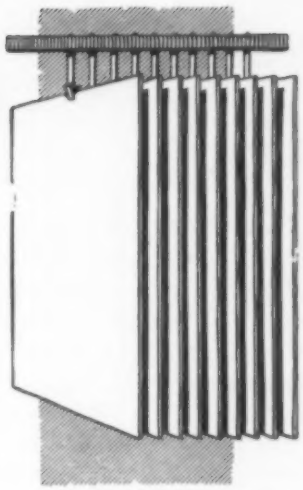


Illustration in sales booklet showing ivory graining

The Counter Attack

Educating the sales clerks speeds up sale of pyroxylin toilet ware

By Leroy B. Steele
Dupont Viscoloid Co.



Showing sheets in seasoning room. (From sales booklet.)

EVERY merchandising man realizes the importance of effectively selling the consumer. For of what avail to build up an elaborate system of merchandising which smoothly and efficiently carries an article down to the hands of the retailer, and then find yourself stumped on the final step.

Yet that is what oftimes happens. Too frequently the retail sales clerk, thru lack of knowledge or information about his product, fails to win the confidence of the customer and make the sale. And lost sales never spelt success in merchandising.

Back in 1922, we of the Du Pont Viscoloid Company conceived the idea that an educational service for the retail sales clerk would be of benefit to the consumer, the retailer, and ourselves.

"French Ivory"

There had been brought to our attention the fact that in many cases, sales clerks, particularly the "green" ones knew nothing about Pyralin. Few could tell what its good points were or how it was made. Very often, in the absence of authentic information, retail clerks would tell a customer things about the product that had absolutely no foundation.

Chief among these was the source of "French" Ivory. In several instances the girl behind the counter would debonairly and confidentially inform the customer that these were made from "cut up elephant tusks." Naturally such information or rather mis-information could do no good and in most cases would do harm.

With this in mind the Du-Pont Viscoloid Company started its series of educational bulletins.

This series, consisting of different informative folders and other data, is sent by mail to all retail clerks who are selling Pyralin toiletware.

Bulletins are issued every other month or six during the year. In most cases they are addressed individually to the sales person or else they are sent in bulk to be distributed by the buyer of the department.

Our list is built up thru the co-operation of the toiletware buyer in each store. by our salesmen and our distributors' salesmen. On their calls they check up to see if each clerk in the toilet department is receiving the bulletin and if not, arrange to have his name added to the list.

The subjects are almost purely educational and informative and are prepared so as to make attractive reading as possible. Many of the subjects are recommended by the salesmen, by correspondence with dealer, retail sales people, or by personal talks which show information is needed on certain subjects. The formation and addition of novel sales plans, in which the retail clerk is a factor, oftimes results in bulletins.

For the new clerk, the one who is totally un-acquainted with toiletware, we have a separate folder. Herein is described in simple, understandable language the high-lights in the manufacture of Pyralin.

Check-ups show that clerks are able to talk about Pyroxylin much more intelligently after having read the bulletins. And a substantial percentage of these retail clerks have, unsolicited, advised us through our salesmen that these bulletins were proving very helpful to them. Knowledge of the product had greatly increased their sales capabilities.

The clerk who explains to a prospective customer the various points about a product, in an intelligent and convincing manner, stands a much greater chance of making the sale. Knowing something about the product which he has bought, the customer becomes interested in it, and this interest manifests itself in additional purchases of the same material at a future time, or in the recommendation of it to some friend.

Copper Pipe for Molding Presses

Flexible connections finding favor and proving their value in many installations

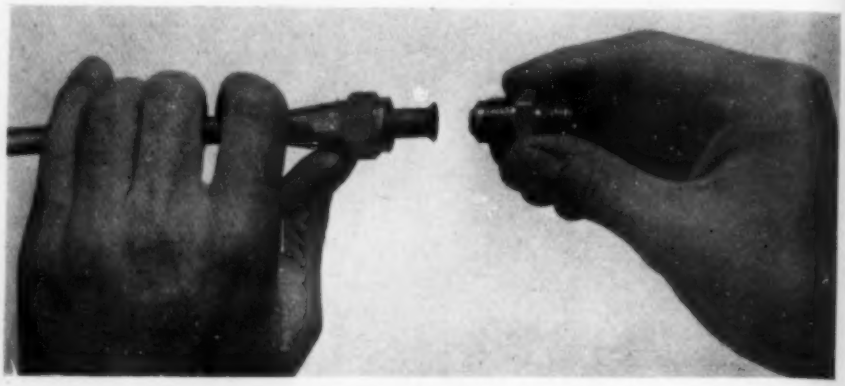
By Leon V. Quigley

REMEMBERING that *Plastics* early expressed a desire for material "new, odd, or interesting," and believing that the present article may seem *new* to some, *odd* to others —perchance *interesting* to a few—the writer submits it to their combined attention. Having occasion recently to visit a number of plastic molding plants the author was favorably impressed by the absence of steam leaks, and was interested to note that the floors seemed especially dry. The desirability of dry floors can best be appreciated by molders whose experience extends back a few years to the time when the typical press room had at least a few pools of water in which workmen could not avoid standing, and when more than a few press connections were continually fizzing steam and dripping water. The proof of the piping is in the leaking, perhaps, and it is the purpose of this article to comment on present practice in press connections, calling attention to the part some of them are playing in keeping modern molding rooms dry.

Copper Pipe For Connections

There is a growing tendency, in the plastic molding industry, to connect steam and water supply lines to the platens or dies, by means of coiled copper pipe with metal-to-metal-joint unions, avoiding the use of rubber gaskets, glands, packing devices, etc.

The accompanying illustrations show quite clearly the construction involved. The device is fundamentally little more than an adequate length of ordinary soft-drawn copper wire, spirally wound so that it can accommodate ram travel and be subjected to only a slight amount of bending stress. The pipe is flared out at each end to a flanged orifice which makes a snug junction with the S. A. E. Standard flared-tubing-union fittings which connect it to platen and supply line.



Tapered end of fitting drawn back to show tapered end of copper tube. (Figure 1.)

The fitting illustrated (Fig. 1) is one made by the Lunkenheimer Valve Company. The tapered member of the fitting is slipped onto the tube before flaring, and when the flange is ready, can be drawn back over and against it. Internal construction of this part of the fitting is just adapted to support the tube, by forming a reinforcing sleeve, and also provides a ground contact for the flange. The male portion of the fitting has a bevelled, ground, annular end surface which, when screwed down against the mouth of the relatively ductile copper flare, makes an extremely tight joint.



Typical Press Connection made of 3-8 inch copper tubing. (Figure 2.)

Preferred to Other Devices.

A simple device, but thoroughly effective—the copper coil has come to be preferred by many engineers who have found that it has eliminated the bother and expense which they previously experienced in trying to keep steam leaks repaired on other kinds of connection. L. M. Rossi, Chief Engineer of the Bakelite Corporation, stated that while his experience had included intimate contact with nearly every type of press connection, he believed that the copper pipe had been an especially effective means of solving the problem of press leaks, and was moreover to be commended

for its simplicity and low cost.

Other types of press connections are those known to the trade as swing joints, slip joints, steam hose, bronze hose with interlocked sections, and woven copper hose. There are undoubtedly installations where each of these several kinds of connection will give satisfactory service. Most of these devices however rely for tightness on a packed joint and although when first installed they may serve perfectly, after a relatively short period, the packing decreases in resilience or volume, permitting leaks which seem only to be temporarily remedied by tightening the coupling. Moreover, it would be difficult to find among the devices just mentioned, one which could compete with the copper pipe unit on the triple score of freedom from leaks, simplicity, and low cost.

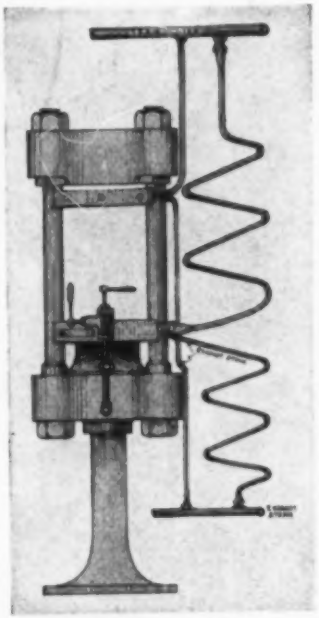
Advantages

The initial cost of the copper pipe makes it cheaper than any other practicable device. It can easily be made by workmen in the molding plant, or even if purchased complete, involves but a small sum.

The cost of six feet of seamless copper tubing, of 9-16" O. D. and 1-16" wall, is about 90c. A standard ½" union costs about 45c. Tubing in large quantities may be purchased already annealed, but usual practice among molders is to anneal lengths as they need them by heating red hot, and then cooling.

Length of service is another important factor. There appears to be plenty of evidence that the copper pipe arrangement lasts well and requires very little attention. The inherent characteristics of copper —especially its permanence and ductility—well qualify it for this service. In this connection, it is interesting to recall the fact that when iron changes under the influence of air and moisture, the rust which is formed is of a porous nature which permits deeper and deeper disintegration of the metal. Copper, on the other hand, forms a dense resistive coating which stops further corrosion. The high degree of ductility and malleability possessed by copper, are other factors which have a decided bearing on its usefulness for press connections. Because extremely pliable, the copper pipe is able to endure thousands of bending stresses before fatigue or internal crystallization causes fracture.

In fairness, there should of course be stated, points which are sometimes proposed as objections to the copper pipe connection. The possibility of a steam pocket forming in an unduly low part of the coil is a theoretical issue raised by some critics. It should be remembered, however, that care must always be taken to so arrange the coilage as to avoid having undrained sections. The presence of pockets is of course productive of trouble, but really there is no excuse for their being present if suitable care is taken in coiling and connecting the pipe.



Press equipped with Flexible copper pipe spirally coiled to accommodate ram travel.

Fig. 3

Some molders suggest that in rapid heat and chill work, the cooling water could not be supplied fast enough through the ⅜" copper tubing frequently used. To this it must be replied that some plants are using 11-16" tubing and finding it entirely satisfactory. Proponents of the above argument also suggest that a larger diameter than ⅜" might be too stiff. Yet users of 11-16" have arranged the loopage so that adequate movement is secured with minimum stress.

Opinions of Users.

The copper pipe set-up is now being adopted on many new press installations, and therefore the opinions of men who have been directly in touch with its application and service should be of definite interest.

Frank M. Shaw, General Manager of the Shaw Insulator Company, Newark, says that the copper pipe has solved their connection problem. It is installed on their large battery of presses, and the molding room, entirely free from leaks, is dry and airy.

The Shaws were early users of steam hose. Next swing joints were borne with during nine years, and leaked in spite of careful attention. During the last four years they have been enjoying the copper pipe. Their coilage is especially good, and the fact that they have had practically no repairs to make may be largely due to this factor.

Obviates Repairs.

Mr. S. Higgins, Department of Mechanical Development, Bakelite Corporation, calls attention to one installation which came under his observation. Steam pressure there was 150-165 pounds, and ⅜" tubing was used with a coil at each end and a straight section connecting. This provided a double spring action and also permitted a very neat and space-saving installation. After a year of constant use the equipment had needed no repair. He recalls another plant where, with the use of swing couples at least one-half day per week was required to repair leaking joints, and the floors were always wet. Now with copper pipe installed. it is rare to see a leak, and the floors are dry.

(*Continued on page 95*)

With the Pioneers III.

The Case of Spill vs. The Celluloid Company

Historic legal battle helped to clarify the situation as to the discovery of celluloid

By Carl Marx

Forty-six years ago the inventors of modern celluloid were assailed in the courts over the use of camphor in pyroxylin plastics. The final outcome had an important bearing on the development of this industry.

THE early history of the pyroxylin plastics in America was enlivened by a legal battle between Daniel Spill of England and the Celluloid Manufacturing Co. The litigation was lengthy and was productive of a rather rare phenomena in jurisprudence, the reversal of an opinion of a judge by himself in a later decision.

The points involved have such an important bearing upon the often discussed question as to "Who invented Celluloid?" and make such interesting reading in the light of our present-day knowledge, that a few minutes spent with this page from the past is well worth while.

Spill and Parkes

Daniel Spill, an Englishman, was employed by Alexander Parkes, the originator of the first pyroxylin plastic material, Parkesine, (see February *Plastics*). In the work connected with his enterprise, Parkes, as has already been described, finally gave up the manufacture of Parkesine, due to the almost insurmountable difficulties which he encountered, about 1867.

Spill, however, had seen enough of this material to become convinced that something really worth while could be done with it, and in consequence thereof continued to work with pyroxylin after he had left the employ of Parkes. He was much more successful than Parkes had been and made such improvements that before long a product known as Xylonite appeared upon the British market and found great favor.

Undoubtedly basing his work upon the rudimentary principles laid down by Alexander Parkes, Spill soon found out that a much better result could be obtained if some resinous substance, especially camphor, were employed in conjunction with a solvent such as common alcohol, termed by him "spirits of wine" as a solvent for the nitrated cotton, then known as collodion cotton or pyroxyline, and more often by its still earlier name, Xyloidine. It was from the latter that Spill coined the word Xylonite, by which name pyroxlin plastics in general are still known in England to this day.

One of his United States patents was No. 97,454, granted November 30th, 1869, for "an improvement in dissolving xyloidine for use in the arts." One of the main points made by Spill in this patent, was the alleged discovery of what today is called the "latent" solvent power of camphor. Spill said:

"That the invention relates to the preparation and use of certain solvents of xyloidine, and which differ from the ordinary known solvents of xyloidine, in that these mentrua which are employed are not, necessarily, in themselves solvents of xyloidine, but become so by the addition of bodies, compounds or substances herein referred to." He stated in his patent that eight different solvents could be used, but he preferred "camphor or camphor oil, or a mixture of the same, in conjunction with alcohol or spirts of wine, the same to be employed in about equal proportions."

Spill also had another patent, No. 101175, granted March 22, 1870, for "an improvement in the manufacture of xyloidine and its compounds," and which covered the bleaching of the nitrated cotton, so as to give a whiter and clearer final product.

The success attained by Spill in England, and the equally great success of the Hyatt brothers at Newark, then operating as the Celluloid Manufacturing Company, naturally led to a clash of interests.

Spill and Hyatt

The Hyatts, as known to perhaps most of our readers, had made the invention that camphor in itself, when heated together with pyroxylin, would combine with it to form what they called Celluloid. This was a distinct invention. The Hyatts did not necessarily require any solvent other than the camphor at all, provided that the pyroxylin were reasonable dry. However, in manufacturing operations, the Hyatts made a mixture of practically dry pyroxylin and camphor, and then added enough alcohol to make the mixture plastic and more readily workable.

This, obviously, clashed with Spill's patent, and he came over to the United States and instituted suit against the Celluloid Manufacturing Co. The trial was inordinately long and the testimony voluminous and highly technical. Finally, however, on May 25th; 1880, the Hon. Judge C. J. Blatchford, rendered a decision in favor of Spill, not only on his first patent, but also on the one for bleaching the cellulose nitrate.

(*Continued on page 97*)



Plastic Products for Food Display

New market for molded and fabricated material

By Henry Frommes
Merchandising Counsel

THE possibilities of further developing the food service fields by manufacturers of plastic products would seem to be almost unlimited in light of certain developments in those fields in the past three years and with which the writer has been in close contact. A few facts will make clear just what this market offers to the trade at the present time.

The widespread adoption of the cafeteria or self help system has gotten the public in the habit of buying food on sight—by what is now called in the restaurant trade, the "eye appeal." Restaurant displays were unimportant until the cafeteria entered as a competitor and placed all of his wares out in plain sight where the buyer could select for himself. Some interesting tests have been made in this connection.

However, lunchroom and table service restaurants have been compelled to depend more upon visual display for sales in order to meet the cafeteria as nearly as possible on an even break.

What the trade needs is the improved application of the plastic arts to produce food replicas and imitations which will offset to some extent the great cost of real food displays with constant, costly changes; and they require an improved plastic imitation which will serve the purpose better than have the somewhat old style papier mache and pressed products.

The food service trades have been given somewhat better food imitations in recent years but there is apparently room for improvement. This is more or less of an artistic problem but it also is one that the plastic arts should be able to solve effectually.

The Potential Market.

There are at present about 70,000 restaurants in this country—public eating places—and not counting hotels, clubs and institutional cafeterias, or cafeterias operating in high schools, colleges, factories, banks and Y. M. C. A. buildings which have no necessity for window display.

Of this 70,000, 15,000 have window display and 10,000 more display food inside, on counters or some such place.

The restaurant man has a number of objections to the display of real food:

a—It proves costly

b—Requires daily change

c—Isn't visually effective to the extent desired in the case of most regular dishes

d—Attracts flies in summer and other vermin

e—In the case of some dishes, disintegration is only a matter of a couple of hours.

The food trades have experimented with various artificial imitations and some of them have proved out very well. One concern in New York has enlisted the plastic arts to produce an ice cream brick that literaly defies detection and which is being sold widely to druggists and soda dispensers. This composition is impervious to water, can be washed off and will retain its surface character indefinitely, while the dyes are permanent and true to life. Whether or not this composition will prove feasible with imitations of other products is a problem.

The manufacturer of plastic products faces a peculiar problem in approaching this food service business since a wide variety of plastic products are required to imitate the various dishes commonly sold to the public.

What the restaurant man wants is an imitation that will be better—for display purposes—than the real thing because the real thing usually tastes better than it looks. The plastic product has to reverse this situation and look better than it tastes!

The saving that could be made with proper plastic imitations of standard food products that would defy detection on ordinary examination would be a big item in restaurant and lunchroom operation. They would soon pay for themselves in the labor and expense eliminated by their adoption.

Great Opportunity.

For this reason, and with the tremendous number of prospective buyers waiting, there should be no difficulty in producing plastic food imitations in quantity with the surety of finding a ready sale.

As it is now, the lunchroom has to have window refrigeration if a choice food display is to last for a day in the summer months. This installation runs into hundreds of dollars.

In producing good imitations of various foods—good enough for window display—the question of coloring appears to be the chief problem to be solved. Ordinary airbrush work and brush paint gun applications leave much to be desired and a certain amount of restraint is necessary to perfect results.

Many of the food imitations now on the market outdo the colors in the natural foods to a great extent and are, when displayed obviously artificial.

It is probable that there are a score of dishes commonly served in restaurants which would be subject to imitation and which the steward would consider most worth while for display purposes. Among these, one steward classed the following items:

Egg dishes	Cup desserts
Steaks	Pies
Chops	Cake
Fowl	Sausage
Fish portions	Griddle cakes

The 70,000 public restaurants in this country are being forced to display foods in order to compete with the cafeteria, which sells its wares on sight—on the "eye appeal" basis.

Improvements in producing standard restaurant dishes sells its wares on sight—on the plastic industries, with their artistic and technical facilities. The market seems to be ready and waiting.

The production of molds, the perfection of compositions which will stand wear and be subject to periodical cleaning will involve a high degree of skill on the part of designers and chemists, there can be no doubt.

But the plastic arts have certainly accomplished feats as difficult from the technical standpoint in the past.

Such plastic imitations of ordinary food products would without doubt find use in domestic science instruction in the schools where girls are taught the preparation and service of food in many forms and for which good models would serve excellently.

Soda Fountains Too.

Soda dispensers are fully aware of the "eye appeal" principle in creating soft drink business and there is a market here for ice cream dishes which will serve the same purpose as food dishes in the restaurant and lunchroom.

The reproduction of ice cream sodas, sundaes and fancy beverages of various kinds would fill a real need with the small town druggist whose soda fountain is his chief source of profit in summer but who cannot display cold drinks in summer months. The steps that have been made toward supplying this need have helped and it is possible to get fairly good imitations of fancy beverages on the market.

But their use is by no means general as yet and probably for the reason that the dispenser is waiting for further improvements.

An Appeal to the Eye.

The cafeteria is serving to educate the public to buy its food upon sight and not according to the printed word on a menu or the verbal praise of the dish by a waiter looking for a tip. Eighty-two hundred cafeterias are already engaged in this educational work. That is why the manufacturer of quality plastic foods will find his product in line with the eating habits of a large section of the public.

Food has to be merchandised today just as have shoes, or hats or hardware. There is keen competition in the restaurant industry and it is generally agreed that there are too many restaurants. The cafeteria is taking on and it is driving the man with waiters to adopt many of its principles, especially the cardinal one of letting people see the food before they order it.

Next Month

Die Hobbing

By W. E. Rahm
Chief Engineer
The Burroughs Co.

The Condensation of Phenols and Aldehydes

Mechanism of the chemical reactions in the formation of synthetic resins

By H. Bartelmy

From La Revue des Produits Chimiques 1925, 28, 371

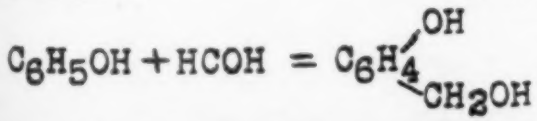
THE condensation of phenols with formaldehyde has been known since the days of Adolph von Bayer in 1873. Kleeberg in 1891 succeeded in making a resinous material by the use of acids and other chemical catalysts in 1891 but it remained for Baekeland to achieve commercial success, beginning about 1909.

The resistance to heat makes these condensation products especially valuable. The physical and chemical reactions that take place are highly interesting and throw considerable light on the mechanism of condensation and resin formation.

When first mixed, phenol and formaldehyde form a clear solution. The addition of a little alkali or acid initiates the reaction, especially on heating. The phenol gradually disappears and an emulsion begins to make itself evident by the increasing milkiness of the solution, until the same suddenly separates into two layers, an oily and an aqueous one.

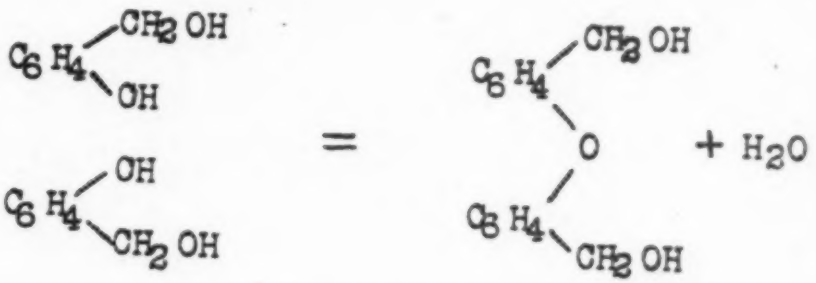
After a little while this oily layer becomes more truly collodidal in its properties, suddenly becoming plastic. In this stage it can be pulled into threads and can, if desired, be mixed with other plastic material, such as cellulose nitrate. On cooling it becomes tougher and stronger.

The chemical side of the reaction can be exemplified by the following equations: First the phenol and the formaldehyde combine to form what is known as saligenin.



Phenol + formaldehyde saligenin

At the end of this reaction, two molecules of the saligenin apparently combined with each other, with accompanying elimination of water, to form a second product, called saliretin:



Two mols of saligenin form one of saliretin

To test the accuracy of this assumption, it is important to ascertain

(1) the mechanism of the reaction.

(2) to be able to forecast the properties of the resultant product.

It is safe to say that the reaction will eventually come to a standstill. The simpler molecules resulting from the initial condensation form what might be likened to "snow-balls," and eventually a stage is reached where the molecular weight and the size of the molecules approaches those of a colloid, and as a result of this growth in size of the molecules the material assumes the properties of a plastic substance.

In this stage the material has many properties in common with the other plastics, such as cellulose, casein, gelatin or such other condensation products as those of urea, thiourea and phenols with formaldehyde and acrolein.

Among the chemical functions of the condensed molecules, the alcoholic group, R.OH exceeds all the others. This group can appear in the molecule either as a metallic alcoholate or as an ester. This gives rise, therefore to two distinct classes of material, which can best be illustrated by the formulae:

1. $[C_6H_4OCH_2H]OK$
2. $[C_6H_4OCH_2H]Cl$

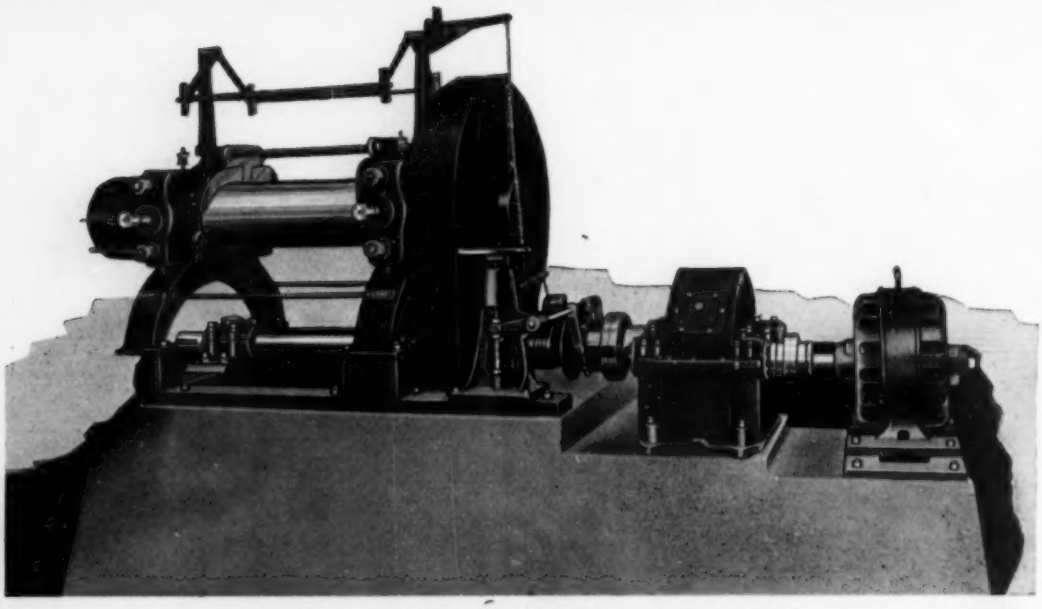
The OK or Cl ions are the deciding factors in determining the essential properties of the condensation product. This makes it easier to understand the differences between products made with alkaline and with acid catalysts. There are in reality only two phenol and formaldehyde condensation product types capable of existence, and they fall into either of the above groups.

For example sodium carbonate, sodium sulfide, sodium cyanide, or sodium hydroxide, in other words materials with an alkaline reaction give rise to products of class exemplified by the first formula above.

As the author has been able to clearly demonstrate as the result of experiments, both of the above types of condensation product, when existing in alcoholic suspension, differ radically in their electrical properties, the

(*Continued on page 102*)

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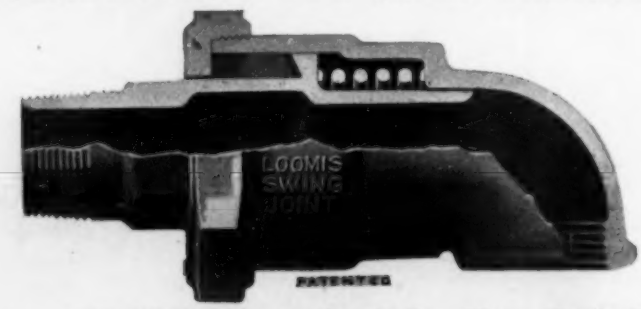
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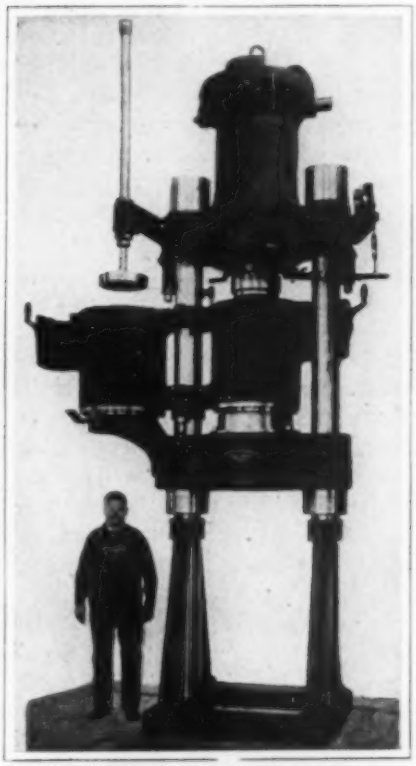
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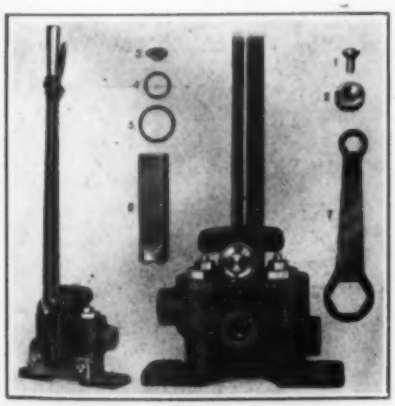
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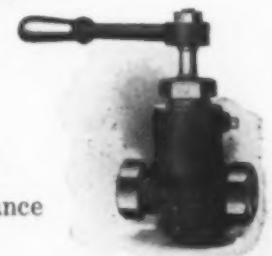
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EDITORIAL · IMPRESSIONS

The Whole Field of "Plastics"

ABOUT every three days someone pops the question, either over the telephone or in person "What is Plastics?" Although a rather full definition is given in the Century, smaller dictionaries are silent on the subject.

Plastic, as an adjective, is defined as the property of a substance by virtue of which it can be formed or molded into any desired shape, as opposed to non-plastic substances which must be cut or chiselled. Examples of Plastic materials, in that sense of the word, are clay, putty, and ceramic-ware in general. Then there is the use of the same adjective as applied to works of art, and here the field is quite different, the word being usually applied to sculpture as opposed to two-dimensional representations as drawing and painting.

Plastics, as a noun, seems to be somewhat of a stranger to most folks, but in these days of rapid development of new arts and sciences, such words soon become part of the language.

So, to settle all arguments, we rise to remark that what we mean by "Plastics" is this: any material that by its nature or in its process of manufacture is at some stage, either through heat or by the presence of a solvent, sufficiently pliable and flowable, in other words, plastic, so that it can be given its final shape by the operation of molding or pressing.

This includes a large variety of materials and hence enlarges the scope of the periodical which bears this name. The German language fortunately has an excellent word that describes all man-made raw materials, and that is "Kunst-stoffe." We aim to have our magazine fill the same place among the English-speaking world as the exemplary German publication that bears this name, but, for the present at least, are not including the very large field of rubber products, as this is ably covered by our contemporaries.

Publicity---Sales---Success

ANY one who is even superficially following the trend of modern plastic materials will be struck by the great rise in popularity of the materials made from casein. Due to aggresive advertising campaigns, judicious publicity and militant salesmanship, these products are crowding the older pyroxylin plastics uncomfortably.

The remedy is obvious. No matter how well known a product might have been, it will soon be superseded by one that is getting publicity and increasing use. The only way to attain leadership, under modern competitive conditions, is to let the world know what you have and can do—and then back it up by making good.

The general public doesn't know the difference between a casein ivory substitute and one made from pyroxylin—or what not. And as long as it doesn't know the difference, the retail distributor can sell it for whatever he wants to. Obviously a well-directed advertising campaign, pointing out the virtues of the time-honored pyroxylin products—directed not only to the consumer, but to the fabricator as well—can have only one effect — increased sales and public confidence. Selah!

PLASTICS

Trade Names

TO prevent any one from ever appropriating their coined word, "Bakelite" and using it on parts made from phenol resins of origin other than that of their own concern, the Bakelite Company is gradually extending the protection of both the name Bakelite and the "infinity" mark to a very wide range of articles—as witness the often-recurring notices regarding such registrations.

This is a modern and healthy tendency. Had the word Celluloid, for example, been thus widely applied in the early days, there never would have arisen any question as to who had the right to call a thing "Celluloid." It is safe to say that for all time only such Phenol Resins as originate from the Bakelite Corporation and its subsidiaries will ever bear the name, and it will not become the generic term for such phenol resins. The same is true of the modern Casein plastics as well —each one guarding their own name and product.

Other manufacturers can draw a valuable lesson from this. Often, even though no patent protection is possible, a good trade name, properly protected and backed by excellence of product, will prove even more valuable than any possible patent—and much easier to guard.

Nothing New?

Multitudinous as the uses for pyroxylin plastics are, it is nevertheless possible to still find new applications for this versatile material. Celluloid has been used to imitate many of nature's products, and to excel them in many instances, but imitation food products must be conceded to be a distinct departure from the trodden paths.

Perfect Artificial Pearl from Oysters

Process of removing nacre from shells disclosed

By Maurice de Keghel

From Revue Generale des Matieres Plastiques, 1925, 1, 15

THE preparation of imitation pearls by the timehonored method of filling thin glass beads with a solution of lacquer containing "pearl essence" or a fish-scale preparation, followed by filling with waxy materials, or the coating of plain glass beads with such solutions followed by lacquers, is an art that has long been practiced.

Much ingenuity has also been expended upon imitation pearls made from various plastic materials. However, in none of these is the weight of the pearl or its chemical composition approached even remotely.

According to a recent French process, pearls can now be produced which almost defy detection, as they are endowed with all the physical properties, weight, feel and appearance. These new imitation pearls, while considerably more expensive than some of the other imitation articles, will, because of their great beauty, undoubtedly soon become very popular and their manufacture will assume comparatively large proportions.

The process is quite unique and combines mechanical and chemical processes. The basis for the new pearls is the nacreous surface portion of common oyster shells. The method of removing this nacreous layer is somewhat involved, but the results justify the means.

The oyster shells are first placed on a sieve and washed in running water, being carefully brushed on both sides to insure absolute cleanliness. They are then boiled for two hours in clear water, washed in cold water, drained and dried.

After that they are kept at 30 to 35 degrees C. in a mixture of 80 parts of glacial acetic acid and 20 parts of water for 72 hours, after which they are again placed in pure water heated to 70 degrees, again brushed, rinsed cold and dried with linen cloths.

The shells are then once more placed in a closed vessel with 50 parts of glacial acetic acid and 50 parts of water and maintained at 40°C for 50 hours. After rinsing once with water at 60°C, brushing, rinsing in cold water, they are again dried, using lintless towels to insure freeness from foreign material.

The shells are now placed in a bowl in a solution of sodium hydroxide free from sodium carbonate and of a concentration of 32° Be and heated at 80°C, being kept just below the boiling point for some time. This will loosen the mother-of-pearl layer from the white shell material. The free leaflets of mother-of-pearl are then taken from the sodium hydroxide solution, rinsed with hot water and cold water and dried with linen.

The leaflets are now placed in a solution of glacial acetic acid and gradually heated to boiling and then kept simmering for four hours and allowed to cool. The leaflets which by this time are quite finely divided are then filtered from the acetic acid solution through a suction filter, yielding a fine, dense almost white paste, which can be preserved until wanted under acetic acid.

From this still moist paste the individual pearls are molded, either in pill presses or by hand. They are then placed upon quartz of similar heat-resistant trays which are provided with recesses to prevent the pearls from rolling about. While in the trays the pearls are baked in electric ovens at 250°C for from 80 to 90 minutes, the heat then being raised to 350°C for another 20 minutes.

The products thus obtained are the crude pearls, in the form

(*Continued on page 104*)

Development of Molded Sound Records

(*Continued from page 82*)

in connection with substitutes.

The shellac, together with mineral fillers which are exemplified by such materials as rotten stone, iron oxide (rouge or caput mortuum), carbon or mineral black, cotton flock or similar fibre, barytes, calcium carbonate and, by some concerns, wood-flour, are first carefully mixed, especial pains being taken to exclude grit and metallic particles which might cause imperfections in the record. The iron particles are usually removed by magnetic separators.



Emil Berliner, inventor of the Gramophone, in his laboratory.

After blending the shellac and fillers, the shellac representing about twenty-five percent by weight of the mixture, the powdered mass is fed onto hot macerating rolls, quite similar to those used in compounding rubber. Here the shellac softens sufficiently to form a plastic composition, which is stripped from the rolls and again placed on the same so that a contin-

(*Continued on page 96*)

Celluloid Printing Plates by Photograph

Recent patent describes novel method

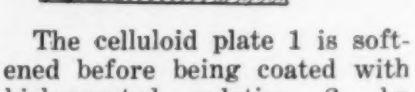
THE flexibility, combined with hardness, which characterizes the pyroxylin plastics, such as celluloid, has led to a great many attempts to use this material as a plate for printing purposes.

In some instances the material was molded, and in some other cases photographic methods were employed to produce the necessary elevations and differences in texture which characterize either an engraving or stereotype.

The production of celluloid printing plates was disclosed as long ago as 1898, in a German patent to Carl Lorch (116252) and in 1901 in a similar patent by Gustav Koppmann, (132696). In the latter patent a celluloid plate is coated with bichromated gelatine, copied by means of light from a negative, developed and the celluloid dissolved away at the points where the gelatine has not been washed away subsequent to exposure. However the process thus disclosed was very imperfect and did not give desirable results.

According to a recent invention of Heinrich Renck, of Hamburg, Germany, U. S. Patent 1,565,815, granted December 15, 1925, the difficulties of making a celluloid printing plate are overcome.

According to the present invention a printing plate shown in the accompanying drawing suitable for practical work is obtained in the following manner:



The celluloid plate 1 is softened before being coated with bichromated gelatine 2, by means of a suitable solvent for celluloid, containing glacial acetic acid or equivalent, so that it becomes spongy or softened on the surface, and on to this surface forming the interuniting sub-stratum layer 3 is then poured liquid gelatine to which has been added glacial acetic acid or equivalent and glycerine. In this way the gelatine combines with the celluloid in an intimate manner, and quickly sets.

This gelatine layer is then chromated and the picture is copied thereon in the usual manner by photographic process with or without screens, and is then treated with a suitable solvent for the non-exposed gelatine and then subsequently with a suitable solvent for celluloid.

By means of this method the non-exposed portions of the gelatine are removed, while the exposed portion of the gelatine together with this support consisting of celluloid in intimate compound with gelatine, are not attacked, but remain in the condition in which they were after the exposure and development.

A printing block suitable for use in practical work is thus obtained.

Flexible Synthetic Resin

Sulfonamides used for base

SYNTHETIC resins have been made for a great number of years, but not one has been found that was suitable for the preparation of flexible films, such as are produced by the cellulose esters.

Lately however, a new type of condensation product has been discovered by Henry A. Gardner, of Washington, D. C., and Patented in U. S. P. 1, 564,-664, granted December 8, 1925. The basis of the invention is a group of resins formed by the condensation of toluene sulfoamids, such as paratoluene sulfoamid, with aldehydes, as formaldehyde or paraformaldehyde. These resins have been named toulene-sulfonamide-aldehyde resins.

It was found that these new resins when dissolved in solvents such as benzol will give highly elastic and serviceable films, and which can be used in conjunction with ordinary rosin, tung oil or fatty acids for making varnish-like preparations. For example a solution of 50 grams of the new resin, 1 gram of rosin, 1 gram of tung oil in 50 grams of benzol is an effective film-forming composition.

However the chief interest lies in the fact that these resins appear to be excellent plasticizers of the cellulose esters, especially for cellulose nitrate and cellulose acetate. The resins themselves are described as semi-solid to solid, clear transparent masses, becoming soft on slight application of heat, and having inherent solvent power for the celluose esters. They are permanently fusible and soluble in the usual cheaper solvents.

The nine claims of the patent cover compositions of matter containing an "organo-oxy-cellulose compound and a paratoluene sulfoamid-formalydehyde resin." The new plasticizer is stated to excell tricresyl phosphate, tripenyl phosphate, butyl phthalate and the like, the films having greater elasticity.

—o—

Zylonite Lensholder.

The zylonite eye-glass holders made by the Bausch & Lomb Optical Co. have, as an identifying mark, a small spot of white metal applied adjacent to each lens of the lens-holder. Under date of November 10, 1925, this company has applied for trademark protection on this metal spot, application 223076, claiming use since the summer of 1921.

Copper Pipe for Molding Presses

(*Continued from page 85*)

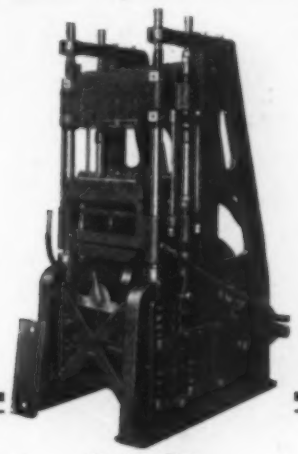
President Edward F. Weston, of the Weston Electrical Instrument Corporation, Newark, says the copper pipe connection is the best thing they've struck yet. The Weston Corporation has a large Bakelite molding plant equipped with copper tubing of 11-16" diameter. Instead of the Lunkenheimer fittings, they use a special coupling made by threading the copper tubing, and attaching a threaded adapter socket, then brazing, and finally connecting to the platen lead-out by an ordinary union. Coilage is large and flexibility adequate. Tool supervisor, H. Hornbruck, and R. H. Murray, Foreman of the Transformer Department, are in daily association with the copper equipment, and thoroughly in favor of it. They buy ordinary copper pipe, and then anneal it by heating red hot, and cooling. The coils have been in service from three to five years with little attention and no leaks.

Mr. B. Z. Moscowitz, Superintendent of the R. V. G. Radio Company, of Brooklyn, tells of having used copper tubing for a period of about one year on a large number of Bakelite presses. He finds that its use results in general economy and dry floors.

Mr. A. J. Crofut, of the molding test department at the Bloomfield Bakelite plant, has had experience there and elsewhere with wet floors in the days of swing joints, and finds that the copper tubing now used on a number of hand presses has proved very satisfactory.

Mr. C. F. Schrimpe, Superintendent of the Perth Amboy plant of the Bakelite Corporation, is thoroughly impressed with the superiority of copper pipe.

In order to secure the best service, care should be taken that the pipe is of suitable diameter; has been properly annealed; and is so coiled as to properly adapt itself to the bend-



Model B-1

Here are the Presses

that you are hearing so much about.

The TERKELSEN
MOLDING MACHINE Presses

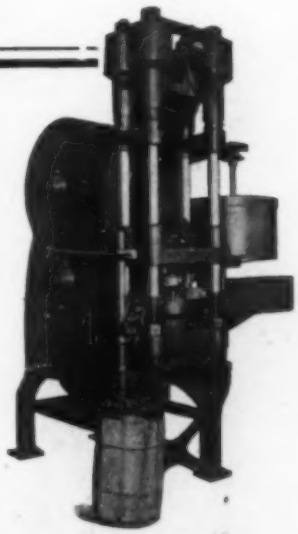
with

the Springs for Maintaining Pressure.
Full Automatic & Semi-Automatic

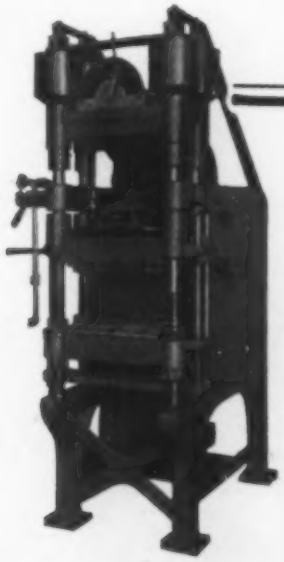
Used for hot and cold moulding and preforming.

Would you care to look through our bulletins

Terkelsen Machine Company
330 A Street
Boston, Mass.



Model C-1

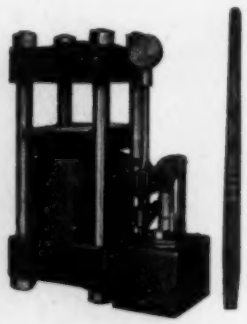


Model A-1

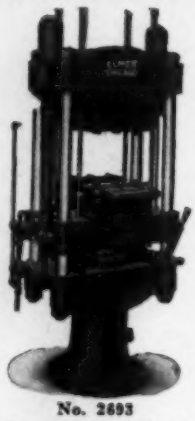
E-HYDRAULIC-
PRESSES PUMPS ACCUMULATORS
ELMES
SINCE 1851

Hydraulic Plastic Molding Equipment

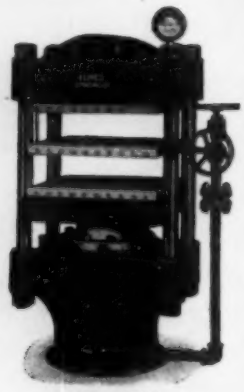
PRESSES - PUMPS - ACCUMUTATORS - VALVES, ETC.
A complete line for the manufacturers of insulating parts
DIALS - KNOBS - VARIOMETERS - BATTERY BOXES
FLAT OR LAMINATED SHEETS, ETC.



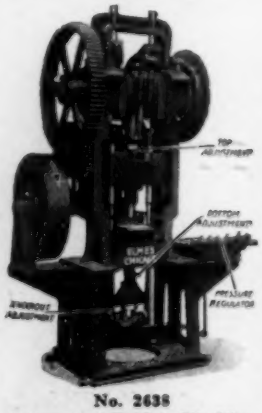
No. 319
Laboratory Testing and Forming Press. For Molding, we can Equip with Intermediate Hot Plates.



No. 2693
Patented Fool-Proof Control

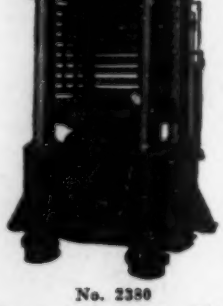


No. 2793
Heating and Chilling Unit Built to suit specifications.



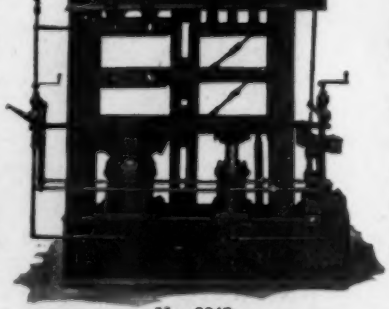
No. 2638
Automatic Tablet Machine for larger Sizes of Preforms From Powdered Materials.

Semi - Automatic Press No. 2693 is the only design of press where knockouts are returned without moving the press ram, or manipulating the valves. This patented feature permits reseating knockouts and die buttons without loss of time, and a maximum clearance for cleaning and refilling dies, which gives 10% to 20% greater output.



No. 2380
Heavy Duty Hot Plate Press Forged Steel Plates.

Automatic Tablet Machine No. 2638 is provided with Special form of Pressure Regulator adjustable to suit product and accommodate a variety of sizes in tablets. Uniform density assured in large preforms by application of pressure on both top and bottom of material. Can stop at any position of stroke.



No. 2247
Combination Heating and Chilling Unit

For MEDIUM and SMALL PLANTS we offer Self-contained Combination Heating and Chilling Unit No. 2247. The Plates are arranged for steam, gas or electricity and cold water circulation. Portable Molds for transferring from Heating to Chilling Press. Automatic Cut-out permits operation of either press at will.

CHARLES F. ELMES ENGINEERING WORKS
1002 Fulton St., CHICAGO, U. S. A.

ing stresses. The loopage must be free from pockets and permit adequate flow and drainage throughout. When these simple precautions are observed, the copper pipe press connection is an effective accessory on molding equipment. The future is bound to witness a more universal appreciation of its service, which will in turn, result in an even greater extension of its use.

—o—

Leominster, Massachusetts—According to an announcement made by the Standard Pyroxoloid Corporation of this city, Wm. H. Lane, its treasurer, has purchased the holdings of J. Philip Legere, its president, giving Mr. Lane sole possession of the corporation.

In 1907 Messrs. Lane and Legere formed the Standard Comb Company for the manufacture of pyroxylin products.

The development of the business was remarkably rapid. The firm now operates three plants consisting of 35 buildings in different parts of Leominster, and will continue under the same name.

—o—

Development of Molded Sound Records

(*Continued from page 93*)

uous mixing and kneading takes place, until at last the whole mass is homogeneous and of the consistency of a fairly stiff putty when hot.

It is then squeezed through rolls which flatten it out into a continuous belt, and is finally cut up into squares of the right weight to form a single record.

The actual molding of the records will be illustrated and described in the April issue of Plastics.

—o—

United Comb Company have just moved their New York offices to 128 West 31st Street, Greeley Arcade, where they are showing a very complete line of toilet ware, manicure sets, etc. The Van Brunt Street factory has been one of the busiest spots in Brooklyn during the past year.

Spill vs. Celluloid

(*Continued from page 86*)

As an injunction was also granted, the Celluloid Company was forced to stop using camphor and alcohol, but very neatly got around the difficulty by starting to use methyl or wood alcohol instead of the "spirits of wine" claimed by Spill.

Spill then again sued, but on Jan. 25th, 1882, the same judge denied Spill's plea for an injunction to restrain the Celluloid Co. from this use of methyl alcohol.

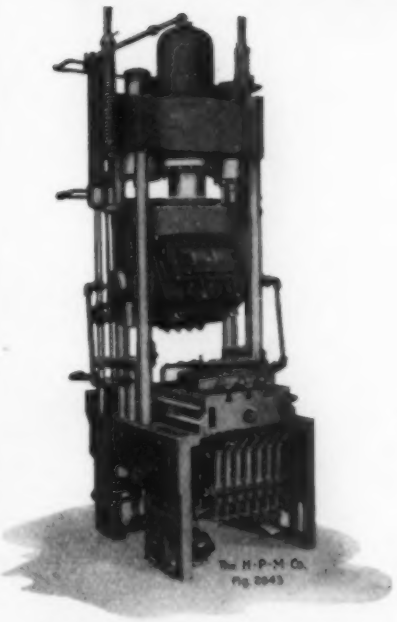
Spill, not satisfied with the decision he had obtained in the first case, and under which he could have obtained a judgment estimated to have been close to three-quarters of a million dollars, again sued the Celluloid Company for their use of wood alcohol and camphor. Here is where he made a vital mistake. Without delving into the legal reasons, it was impossible for the Celluloid Company to introduce some new evidence which they had discovered since the first trial, but this new attack of Spill's left the field wide open for its introduction.

This the Celluloid Company's counsel did so effectively, and proved so conclusively to the satisfaction of Judge Blatchford, that he reversed his previous decision and held both of Spill's patents invalid and void for lack of invention.

In other words, and the records of the case bear this out very well, it was definitely shown that it was Alexander Parkes who had first used camphor and solvents together. This was contained in Parkes' English patent No. 2359 of October 22, 1855, a statement to the effect that "vegetable naptha" was in itself a solvent of gun-cotton. Now "vegetable naptha" in England is what we call wood alcohol or more properly methyl alcohol (the methanol of today). This became extremely important in view of the fact

(*Concluded on page 100*)

You'll find that H-P-M Presses Pay for themselves QUICKLY



H-P-M Presses have demonstrated themselves one of the best paying investments in the Plastic Molding field. They are readily adaptable to any pressing problem and soon pay for themselves in increased production.

Fig. 2643—Automatic Thermo-Plastic Molding Presses for Bakelite, Celluloid, etc.

When you install H-P-M Presses you add 50 years of press engineering experience to pour working equipment. Put this experience to work for you today. You will soon be repaid plus good dividends on your investment.

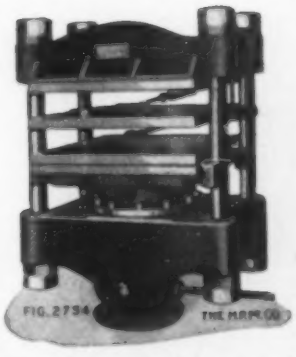


Fig. 2754—Hot plate press of the upward plunger type Molding bakelite, etc., using plain hand molds also for molding and vulcanizing rubber goods.

THE HYDRAULIC PRESS MFG. CO.

There's a type and size for your service

552 LINCOLN AVENUE

MOUNT GILEAD, OHIO

TECHNICAL ABSTRACTS
AND PATENT REVIEW

MULTICOLORED CELLULOID ARTICLES. Carl Bensingen, German Patent 412650. December 12th, 1920.

Vari-colored celluloid articles are prepared by the superposition of colored sheets of celluloid of varying thickness.

ARTIFICIAL RESINS. Kunstharzfabrik Regal & Co., Jan Novak and Jaromir Kostal, Austrian Patent 100295, Feb. 4, 1924; Chechoslovakian Patent 15,438, 1924.

Phenol-formaldehyde resins are prepared by the use of ozone, ozonides or substances capable of yielding ozone, as a catalyst in the condensation. The yield is said to be better and the reaction to take place faster.

UREA-FORMALDEHYDE CONDENSATION PRODUCT. H. Ramstetter, assignor to the Badische Anilin-und Sodafabrik, German Patent 416252, Jan. 31, 1923.

Urea or urea derivatives are condensed with formaldehyde or polymers of the same with or without the use of catalysts, under the action of short wave-length light radiations, which are stated to induce the reaction. The resultant products are said to be stronger, harder and less soluble in water.

MANUFACTURE OF POLLOPAS-UREA-FORMALDEHYDE CONDENSATION PRODUCT. Dr. Fritz Pollak, Austrian Patents 99415 and 99906, April, 1923.

According to the first patent, urea and formaldehyde in the form of the commercial aqueous solution is boiled in the absence of any hydrogen ions (i. e. in a non-acid medium), and then boiled some more with the addition of some acid, acid salt of an ammonium salt capable of yielding hydrogen ions. An hydrophobe (i. e. non-water-soluble) product separates either directly or upon partial evaporation of the mixture. The resultant product is dried in a vacuum. In its final form the condensation product is water-white, transparent, and suitable for making lacquers, etc. It can be colored to suit.

In accordance with the second patent, the soluble product obtained as above or,alternatively,such products as are formed by heating dimethylolurea or thiourea with water, are treated with substances capable of combining with or destroying formaldehyde. As specific examples there are given: urea, thiourea, derivatives of the latter, phenols, hydrosulfites, ammonia, hydrazine, or hydrogen dioxide. Hard, insoluble condensation products result. While these are still hot, they are poured into molds and given their final form at from 60 to 100°C.

(The above patents cover the manufacture of the material known as Pollopas, for a full description of which see Plastics, 1925, 1 85. (December.)

CASEIN AND RUBBER PLASTIC. William Hall Simons and the British Xylonite Co., English Patent 232011, March 15th, 1924.

Casein is mixed with 5% of its weight of diluted uncoagulated rubber latex, formed in the usual manner and hardened with formaldehyde. Vulcanizing agents to convert the latex must not be coagulated before admixture with the casein. The resultant plastic products are less brittle than those from straight casein, and can be cut and worked more easily.

CONVERSION OF RESITES (insoluble phenol resins) INTO NOVOLAKS AND RESOLES (soluble phenol resins.) Carl Kulas and Curt Pauling, German Patent 412170, June 6, 1923.

The insoluble phenol-resins are heated at atmospheric pressure with a phenol until dissolved and finally the excess phenol employed for this purpose is condensed with formaldehyde in the presence of alkaline or acid catalysts. Alternatively only enough phenol is used to initially soften the insoluble phenolresin, more phenol then added and subsequently condensed with formaldehyde.

PHENOL-RESIN MANUFACTURE. Carl Kulas and Curt Pauling, German Patent 414959, Feb. 24, 1920.

Phenol and formaldehyde are heated with acid catalysts until the resin forms and the solution separates into two layers on cooling a sample of the mixture. To the still warm mixture more than enough alkali to completely neutralize the acid catalyst is added, followed by additions of fresh portions of phenol and formaldehyde, the heating being then continued until the condensation is complete.

If in the second stage of the process an excess of formaldehyde is used, a primarily fusible and soluble resin results, which, however, can be very readily hardened and rendered insoluble when desired. (see also German Patent 412170, above).

RESINOUS CONDENSATION PRODUCT. Konstantine Tarassoff, English Patent 223636, July 18, 1923.

A mixture of phenol and oil of turpentine is heated to 70 to 75°C. naphthalene-sulfonic acid and, if desired, castor oil is added, and the heating continued up to 150°C, the mixture cooled, formaldehyde added, and subsequently kept at 50°C until complete condensation has been effected, water separating as the condensation progresses.

The product is a thickly fluid mass, suitable, when dissolved in benzene, toluene or similar solvent, for impregnating fabrics or as a lacquer, etc.

RESINOUS CONDENSATION PRODUCTS FROM AROMATIC HYDROCARBONS AND ARALKYL-HALOGENIDES. Farbenfabriken vormals Meister, Lucius & Bruening, German Patent 416904, January 17, 1920.

Aralkyl halogenides, without catalysts or pressure, are allowed to act on poly-nuclear aromatic hydrocarbons or their halogen derivatives, naphthol hydrides being, however, excluded from the scope of the patent.

ARTIFICIAL RESINS. Society of Chemical Industry at Basle, Swiss Patent 106471, and 106472, Sept. 1, 1922.

A resin obtained by the action of sulfur upon alpha-naphthol is treated with acetylizing agents. Sulfur-resorcinol resins are treated with benzoylating agents. The resultant new resinous products are said to be suitable for the preparation of lacquers, for impregnating or as binding media in plastic materials.

PULVERIZING HORN. Franz Thomas. U. S. Patent 1511987.

Natural horn can readily be powdered by grinding the same under water.

DEHYDRATING CELLULOSE ESTERS AND ETHERS. Jean Henri Bregeat, English Patent 226142.

Absolute alcohol is employed for removing the moisture from cellulose esters or ethers. This is not only a much better dehydrating agent than ordinary commercial (95%) alcohol, but also tends to purify the material by dissolving foreign matter such as resins, lower esters and ethers, and oils.

COMB-MAKING MACHINE. Firm of Fritz Claussner. German Patent 414928.

The clamp that holds the blanks is arranged so that it can be revolved or remain stationary at the will of the operator, so that either the blank or the cutting toll can move relative to each other.

CELLULOSE PLASTIC. Firm "Phoenix," Germany. German Patent 421407, 1923.

The apparatus is suitable for mold-

ing such composition products as celluloid, cellulose acetate and similar material. A predetermined amount of the plastic mass is forced by means of a plunger into the molds, which are arranged on a rotatable table. A special arrangement brings forward the measuring vessels which contain the plastic charge and returns the empties, so that rapid, automatic molding can be realized.

PYROXLIN PLASTIC WASTE; RECOVERY OF.

In accordance with French Patent 521312, applied for December 15th, 1924, waste material containing pyroxylin plastics is treated for the recovery of the latter with sulfuric acid of specific gravity of 1.5, until the ordinary celluiose present has been gelatinized and partly solubilized, when it can be washed out of the mixture. The process can then be repeated with the same strength sulfuric acid, which will remove the last traces of the cellulosic material without affecting the pyroxylin.

CELLULOSE ESTER PLASTICS. K. Ott, K. Schaffganz and Chemische Fabriken vormals Weiler-ter-Meer. German Patent 412884, Dec. 13, 1923. Class 39-b.

Cellulose esters are plastiziced by means of aliphatic esters of ortho-cyanocinnamic acid, amyl ortho-cyanocinnamate being the preferred product.

PYROXYLIN PLASTIC OPHTHALMIC MOUNTING. E. J. R. Beattey, assignor to Universal Optical Corporation. U. S. Patent 1,566,361, Dec. 22, 1925.

"Oxford" mountings for spectacle frames when made of pyroxylin plastic materials such as celluloid, zylonite or the like suffer from the defect that the nose-guards of the same can not be bent or adjusted exactly to the wearer's nose and hence fail to hold properly. This is overcome by the addition of some gripping material, preferably shark's skin, which is attached to a small spot on the nose guard. Seven claims cover the constructional details of the frame and guard.

PYROXYLIN FOR COATING STRAW HATS. Charles J. Kuntz and Joseph Simons, U. S. Patent 1,566,798, Dec. 22, 1925.

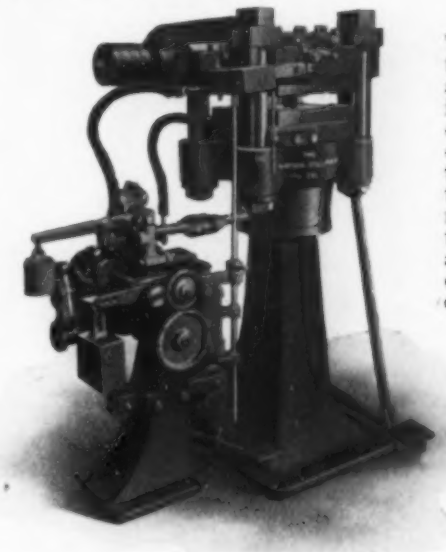
Straw hats are rendered moisture proof by applying a solution of cellulose nitrate, gum sandarac and gum elemi. The prefered proportions are: solution of cellulose nitrate, 6 oz. per gallon of amyl alcohol; gum sandarac, two pounds per gallon of denatured alcohol; gum elemi, two pounds per gallon of denatured alcohol; finished lacquer: eight parts of the cellulose nitrate solution, 1½ parts sandarac solution, ½ part gum elemi solution. A mixture of amyl acetate and fusel oil is suggested as a thinner. Acetyle cellulose may replace the cellulose nitrate. The purpose of the gums is to cause the cellulose nitrate film to adhere to the glue in the straw hat.

WATSON-STILLMAN

Hydraulic Molding Presses

WITH TILTING HEAD

This press is designed primarily to increase the production and decrease labor in the operations involving the molding of plastic materials.



These presses are practically automatic; the application of hydraulic pressure, duration of time of steam and cold water circulation through the dies controlled by the valve mechanism. These automatic features do away with the human element in the timing of the heating and cooling of the dies, thereby insuring a uniformity as well as materially increasing production.

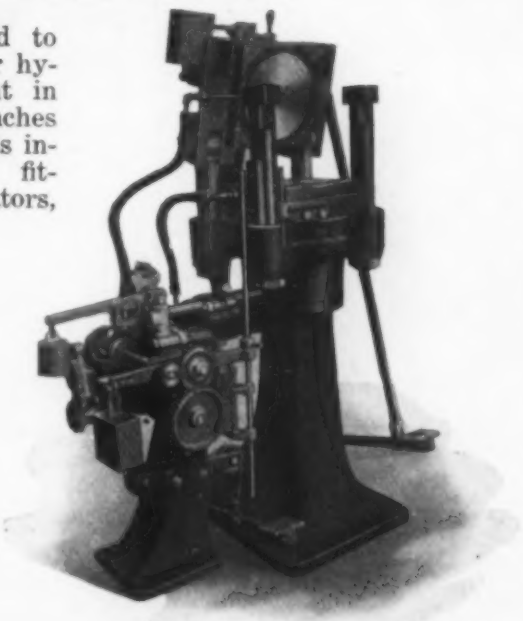
Showing Press with Head Closed

This is but one of our large line of presses especially designed for the molding of Rubber, Gutta percha, Celluloid, Casein, Bakelite, and other plastic materials.

We are equipped to handle orders for hydraulic equipment in all its many branches from pipe to press including valves, fittings, accumulators, pumps, etc.

Our Experience of Over 77 Years Is At Your Service

Write for Bulletins



Showing Press with Tilting Head Open

THE WATSON-STILLMAN CO.

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Chicago, McCormack Building
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Cleveland, Leader-News Building

WALTER H. BROWNING

NORTH ARLINGTON N. J.

Representing

NIXON NITRATION WORKS

(See Back Cover)

The Case of Spill vs. The Celluloid Company

(*Continued from page 97*)

that another of Parkes' patents, No. 2675, of October 28, 1864, he showed that he could use practically anhydrous wood alcohol as a solvent. And finally in his patent No. 1313, of May 1865 Parkes makes the highly important statement that "I also, according to my invention, render the ordinary volatile solvents more suitable for use by the addition of *camphor*."

This so clearly anticipated what Spill claimed as his own invention, that there was nothing left for Judge Blatchford to do but to hold Spill's patent invalid, and this he did.

This apparent "reversal without cause" as it was heralded about in England, becomes perfectly plain to any one who will take the trouble to look up the records. For the benefit of those so inclined, the decisions can be found in the Federal Reporter, Vol. 2, page 707; Vol. 10, p. 290; Vol. 21, p. 631 and Vol. 22, p. 94.

Even as late as 1884, Spill was still trying to obtain a reversal of his case, by an attempt to introduce new evidence, but was ruled against by Judge Blatchford. This effectively disposed of Spill as a litigant and he returned to England.

However, and from the viewpoint of the pyroxylin industry, Spill's work was nevertheless productive of much progress, and although he failed to stop the Celluloid Co. he succeeded in interesting enough capital to start a plant to manufacture his Xylonite in the United States. For purposes of euphony, and other reasons, they decided to call the product Zylonite, and a factory was established in Adams, Mass, in 1881.

BAKELITE MOULDINGS

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Our **Engineering Experience** and **Modern Equipment** enables us to thoroughly and expertly meet your **problems.**

RAWSON MOULDING CO.

24-26 Pine St. WALTHAM, MASS.

CUTTING DIES

and

POLKING CUTTERS

We are especially equipped to manufacture all kinds of cutters for the celluloid trade.

T. J. BEAUDRY & SON

MARLBORO, MASS.

BOSTON OFFICE—111 LINCOLN ST.



Accessories
For Toilet Articles



BOXES

Boxes of the better kind to meet your individual requirements

Perfumers & Jewelers Box Co.
307-309 Sixth Avenue
New York

Howard Specialties Company, Inc., one of the largest manufacturers of celluloid manicure and toilet articles, has opened a New York show room at 1107 Broadway, corner 24th Street. A complete line of toilette sets boxed and unboxed, in unusually attractive and unique patterns, and in a wide range of color effects and combinations will be shown here.

Mr. Ed. Neugass, secretary of the organization, will be in charge of the new show rooms.

J. H. Meyer Brothers, Inc., have filed a suit against the Fiberloid Corporation alleging infringement of the patent of E. F. Higgins, for the maufacture of imitation mother-of-pearl, U. S. Patent 1,539,084. Suit was filed Nov. 10, 1925.

TOILET GOODS

A Monthly Magazine for Buyers of Toiletries and their Sales Clerks.

A sample copy of Toilet Goods and Circulation Analysis will be sent on request.

TOILET GOODS
18 W. 34 STREET
NEW YORK

J. Chester & Sons Co. have moved their glass and mirror plant to 41 Varick Ave., Brooklyn, N. Y.

Mr. N. Chester will be in charge of the mirror glass business of the organization.

An additional space of fifty feet has been allotted the toilet goods section of Jas. McCreery & Company to make room for this rapidly growing department, comprised of two units, one devoted to the display and sale of toilet requisites, the other to ivory goods. Under the management of W. H. Cherry, buyer, the volume of sales in the toilet goods section has nearly doubled within the past year.

H. A. Cook has left the H. A. Cook Co. of which he was formerly head, and is now associated with the Nixon Nitration Works.

The plant, which is devoted to the manufacture of fountain pen tubing, will be under the supervision of Frank Berge.



Quality in the Mirror reflects Quality in the product

Standard Mirror Co.
151-157 HARRISON ST.
Buffalo

According to J. M. Mack, in the Du Pont Magazine for December, 1925, pyroxylin is a splendid material for making casings for telephone headsets, such as are used in radiotelephone reception. The Robbins and Myers Co., of Springfield, Ill., have recently placed such head-sets on the market, called the "Melofone headset."

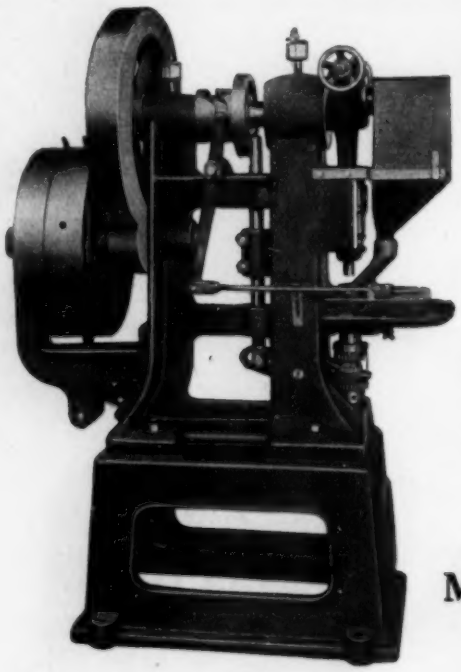
"Putting Toilet Sets in the Gift Class"

In Plastics for April

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STOKES

Bakelite Preforming Machine



40 to 60

preforms per minute

Weights accurate and easily adjusted

Odd shapes and perforated pieces easily produced

We also manufacture a **Measuring Machine** which weighs without preforming

F. J. STOKES MACHINE CO.

5834 Tabor Road, Olney P. O. Philadelphia

Highest Grade

CELLULOSE ACETATE

Stability.
Low acidity.
Clarity.
Uniformity.
Any desired viscosity.
Prompt Delivery.

Accurately controlled for definite solubility factors in various solvents, milled to a uniform bulk per weight and adjusted to obtain maximum solution in minimum time.

Made in U. S. A. Samples sent on request.

Sole Sales Agents

American-British Chemical Supplies, Inc.

Room 1505 *Telephone, Ashland 2266*

15 East 26th St. **New York**

Phenol-Aldehyde Product

(*Continued from page 89*)

particles of condensation product of type I going to the cathode and particles of condensation product of type II going to the anode.

On the addition of small amounts of an alkali, the stability of the emulsion can be considerably increased. The addition, on the other hand, of even a small amount of a strong acud leads to the instantaneous precipitation of both types of suspensions.

Thus it follows that the condensation does not escape the general laws of chemical mechanics. The speed of the reaction is greatly influenced by the choice of catalyst, the increase in temperature likewise contributing. It will often be noticed that on grinding up such condensation products that small amounts of "serum" (that is, mother liquor) will be found enclosed within the same. This points to the conclusion that evidently that the molecular contraction of the products is not the same at the center than as at the surface.

The Improved ARROW Routing Machine

Manufactured By

Geo. Langenecker

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Artificial Pearls

(*Continued from page 93*)

of slightly lustrous beads which are, however, not iridiscent as yet. After having the hole drilled into the same they are immersed in a solution of potassium silicate covered with a thin layer of a cellulose nitrate solution made by dissolving 1 gram of cellulose nitrate in 75 grams of 96% ethyl alcohol and 26 grams of ethyl ether and 10 grams of benzine and which solution should be allowed to stand for from 6 to 8 hours.

On withdrawing the beads from this solution they will coat themselves with a very thin layer of cellulose nitrate, which will dry practically immediately. Due to its thinness and the nature of the base material, the pearls will now have the desired play of iridiscent colors.

If desired, it is of course possible to treat the crude pearls with an acetone solution of fish-scale (pearl) essence before soaking them in the silicate solution.

When properly made in accordance with the above description, these artificial pearls can not be differentiated from the natural product.

—o—

New German Firm.

A new firm dealing with celluloid, both the raw material, complete fabricated articles as well as waste, has been organized in Germany under the name of Halb-und Fertigfabrikate," at Berlin, W-9, Potsdammerstrasse No. 17.

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"Brunswick"

Under date of Feb. 12, 1925, the Brunswick-Balke-Collender Company have filed an application, published December 29, 1925, for the word BRUNSWICK, covering a large number of products used in connection with radio sets, and specifically such plastic products as dials, knobs, sockets, hardrubber and Bakelite panels and loud-speaker horns.

"Phenolite"

The National Vulcanized Fibre Co. has applied for a trademark on their electrical insulating material, evidently of the phenol resin type under date of June 23, 1925, Serial No. 216,280 and published Dec. 29, 1925. The name is PHENOLITE.

"Bakelite"

The Bakelite Corporation has again further extended the field covered by their trademark, in this case consisting merely of the word "BAKELITE" by including an "ornamentation simulating beaded designs on cotton, silk, artificial silk, and wool fabrics." Application was filed October 23, 1925, Serial No. 222,151, published Dec. 29, 1925.

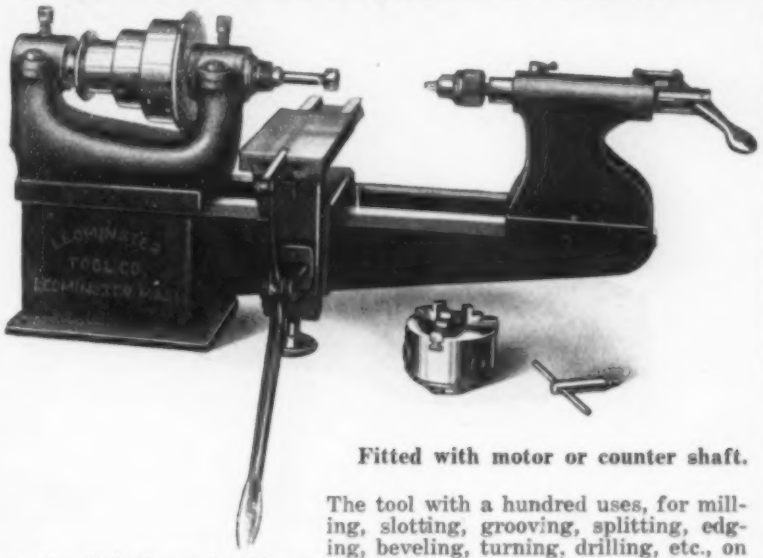
Trend in Pearls

Several large Pearl working manufacturers in New Jersey, it was learned thru reliable sources, are extensively experimenting with plastic materials.

Simultaneously comes the interesting news about the scarcity of mother of pearl shell. According to Victor F. Nekarda, an executive of the Paragon Button Corporation, one of the largest manufacturers in the business, a pearlers association, composed of factors along the East coast of Australia, is mainly responsible for the restriction of the supply.

The concerns working in pearl shell see definite relief from the prevailing situation by the use of plastic materials. Several of these concerns contemplate using such plastics as a permanent change from the mother of pearl shell.

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